IS 1112-2 (1989): Glass shells for general lighting service lamps Part 2 - 81 to 130 mm shell diameter [CHD 10: Glassware]

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IS 1112 (Part 2) : 1989
(Reaffirmed 2001)

Indian Standard

GLASS SHELLS FOR GENERAL LIGHTING SERVICE LAMPS — SPECIFICATION

PART 2 81 TO 130 mm SHELL DIAMETER

(Second Revision)

भारतीय मानक

सामान्य प्रकाश-सेवा के लैम्पों के लिए काँच के खोल

भाग 2 81 से 130 मि. मी. व्यास वाले खोल

(दूसरा पुनरीक्षण)

UDC 666·175·6 : 621·32

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

September 1990

Price Group 2

FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards on 28 November 1989, after the draft finalized by the Glassware Sectional Committee had been approved by the Chemical Division Council.

This standard was first published in 1957 covering shell diameters upto 75 mm. It was revised in 1963 to cover nominal diameters upto 170 mm in order to meet the requirements of glass shells covered in IS 418 : 1963 'Specification for tungsten filament general service electric lamps (*revised*)' and IS 897 : 1957 'Specification for tungsten filament electric lamps for railway rolling stock.' Subsequenty IS : 418 was revised in 1978 because of which the Glassware Sectional Committee decided to revise this standard also to ensure conformity between the two standards.

While revising this standard, the committee decided to bring it out in three parts, Part 1 covering glass shells with diameter from 60 to 80 mm, Part 2 with diameter from 81 to 130 mm and Part 3 with diameter above 130 mm.

In this revision (Part 2), bubbles, adhered glass, annealing, ovality, wall thickness, sampling procedure and seaminess requirements have been modified. Weigh group, blisters, seeds and weathering on storage requirements have been deleted.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*).' The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

GLASS SHELLS FOR GENERAL LIGHTING SERVICE LAMPS — SPECIFICATION

PART 2 81 TO 130 mm SHELL DIAMETER

(Second Revision)

1 SCOPE

This standard (Part 2) prescribes the requirements and the methods of sampling and test for glass shells for general lighting service lamps of nominal bulb diamters not less than 81 mm and not more than 130 mm.

2 REFERENCES

The following Indian Standards are necessary adjuncts to this standard.

IS No.	*Title*
1382 : 1981	Glossary of terms relating to glass and glassware (*first revision*)
4905 : 1968	Methods for random sampling

3 TERMINOLOGY

3.1 For the purpose of this standard, the definitions given in IS 1382 : 1981 in addition to the following shall apply.

3.2 Neck

The part of a shell between edge and shoulder (*see* Fig. 1).

3.3 Neck Diameter

The neck diameter shall be measured near the sealing point of the shell (*see* Fig. 1).

3.4 Shell Diameter

The nominal diameter of the shell is known as shell diameter.

3.5 Edge

Lower portion of the shell is known as edge.

3.6 Offset Finish

The entire finish is shifted to one side in relation to the vertical axis of the glass shell and is, therefore, eccentric to the shell neck.

3.7 Crooked Finish

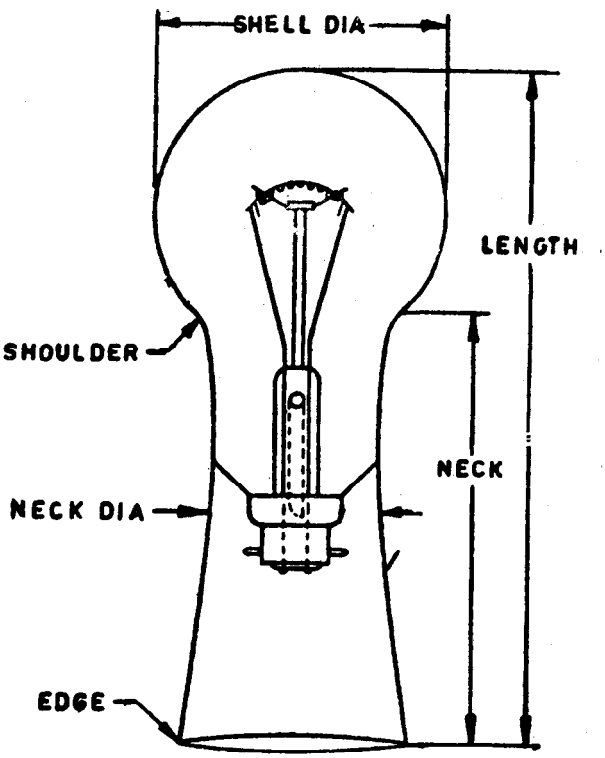
The neck is not vertical in relation to the shoulder.

4 REQUIREMENTS

4.1 Dimensions and Tolerance

4.1.1 *Length and Diameter*

When tested according to the method prescribed in Annex A, the length and diameter of the glass shells shall be in accordance with the drawing accepted by the manufacturer and the purchaser.



NOTE — This is only a typical representative shape to indicate various terms used.

FIG. 1 THE SHELL AND THE LAMP

4.1.1.1 The tolerance on overall length and nominal diameters shall be ± 3 mm and ± 1·5 mm, respectively.

4.1.2 *Wall Thickness*

At any point of the shell, the wall thickness shall be not less than 0·35 mm.

4.1.2.1 *Wall thickness at neck*

The wall thickness at neck (at the sealing point) of the shells of different nominal diameters shall lie between the following values:

Nominal Diameter of Shells	*Range of Wall Thickness at Neck*
mm	mm
81 to 90	0·4 to 1·1
91 to 110	0·4 to 1·1
111 to 130	0·5 to 1·3

4.1.2.2 *Wall thickness at crown*

The wall thickness at crown for different shell diameters shall be as follows:

Diameter of the Shell	*Wall Thickness at Crown*
mm	mm
81 to 90	0·8 to 2·3
91 to 110	1·0 to 2·5
111 to 130	1·0 to 2·5

NOTE – Shell may be graded in accordance with the neck wall thickness ensuring requirements of **4.1.2.1** and **4.1.4** by the agreement between the purchaser and the manufacturer.

4.1.3 *Ovality*

The permissible ovality in case of neck and blown diameters for glass shells from 81 mm to 90 mm shall be 2·0 percent and 91 mm to 130 mm shall be 2·5 percent of the maximum diameter of the bulb without exceeding the tolerance limits for the nominal diameter (*see* **4.1.1.1**).

4.1.4 *Seaminess*

Seaminess at any section of sealing in zone shall not be more than:

0·6 mm for	81 to 90 mm
0·7 mm for	91 to 110 mm
0·8 mm for	111 to 130 mm

4.2 Workmanship and Finish

4.2.1 *Bubbles*

a) Open bubbles or bubbles which can be burst with finger nail on any part of the shell are not acceptable.

b) Closed bubbles below the sealing zone will not be considered as defects.

c) Closed bubbles allowed above the sealing zone shall be as follows:

i) *For shell diameters 81 to 90 mm:*

Bubbles Size (Diameter) mm	*Max No. Allowed*
Less than 0·5	20 (5 per cm² of surface)
More than 0·5 upto 1·0	6 (4 per cm² of surface)
More than 1·0 upto 2·0	2 (2 per cm² of surface)
More than 2·0 upto 3·0	1

ii) *For shell diameters 91 to 130 mm:*

Bubbles Size (Diameter) mm	*Max No. Allowed*
Less than 0·5	25 (5 per cm² of surface)
More than 0·5 upto 1·0	7 (4 per cm² of surface)
More than 1·0 upto 2·0	3 (2 per cm² of surface)
More than 2·0 upto 3·0	1

The bubbles to be checked with unaided eye/ magnifying glass.

4.2.2 *Cords and Striae*

Glass shells with dia 81 mm to 130 mm shall be free from such cords and striae which shall obscure transmission of light in a finished lamp.

4.2.3 *Stones*

Glass shells shall be free from metallic particles or stones not fully covered by glass. A maximum of 4 stones of diameter not exceeding 1 mm fully covered with glass may however be allowed in a shell. No stones shall be allowed in the sealing zone.

4.2.4 *Stones and Knots*

The total number of stones and knots shall not exceed 6 in shells of diameter 81 to 90 mm and 7 in case of shells of diameter from 91 to 130 mm. Minimum distance between any two faults except bubbles of sizes less than 0·5 mm shall be 15 mm.

4.2.5 *Adhered Glass*

The maximum acceptable size of a piece of glass or small foreign particle welded to the shell

surface, which cannot be removed without causing a chip or check shall be 0·75 mm, maximum number of such defects in a shell shall not exceed 4.

4.2.6 *Defects in Blowing*

Glass shells shall be as free as possible from deformities of shape, such as off-set, crooked finish, slant out, etc, and such other defects as mould marks, scratches and depressions.

4.2.7 *Finishing*

4.2.7.1 *Edge*

The edge of glass shell shall be well rounded off and free from crizzles.

4.2.7.2 *Checks or cracks*

Glass shells shall be free from checks or cracks, for example, 'fissures' extending through or into the wall of the shell not more than 2 mm from the edge.

4.3 *Annealing*

Glass shells shall be reasonably free from strains. The strain may be checked by a polariscope.

5 PACKING AND MARKING

5.1 Packing

The glass shells shall be packed as agreed to between the manufacturer and the purchaser.

5.2 Marking

All packages shall be clearly and indelibly marked with following information:

a) Size;
b) Indication of the source of manufacture;
c) Month and year of manufacture; and
d) Identification mark in code or otherwise to enable the batch of manufacture to be traced from records.

6 SAMPLING

6.1 Lot

For the purpose of this standard all the glass shells for general lighting service lamps of the same nominal dimension and the same wattage shall constitute a lot. Each lot shall be separately inspected for testing conformity to this specification.

6.2 Sampling and Criteria for Conformity

The number of glass shells to be sampled from each lot is given in Table 1. The sample shall be drawn by the method of random selection as per IS 4905 : 1968.

Table 1 Scale of Sampling

(*Clauses* 6.2, 6.2.1 *and* 6.2.2)

Lot Size	For Clause 4.2 and 4.3		For Clause 4.1	
	Sample Size	Acceptance No.	Sample Size	Acceptance No.
(*N*)	(*n*)		(*n*)	
(1)	(2)	(3)	(4)	(5)
Upto 25	5	0	3	0
26 — 50	8	1	5	0
51 — 100	13	1	5	0
101 — 150	20	2	8	0
151 — 300	32	3	13	1
301 — 500	50	5	20	1
501 — 1 000	80	7	32	2
1 001 — 3 000	125	10	50	3
3 001 — 10 000	200	14	80	5
10 001 and above	315	21	125	7

6.2.1 The sample glass shells selected as per col (2) of Table 1, shall be examined for the characteristics covered under **4.2** and **4.3**.

A glass shell failing in one or more of the requirements of **4.2** and **4.3** shall be termed as defective.

The lot shall be accepted as conforming to specification if the total number of defectives is less than or equal to the acceptance number given in col (3).

6.2.2 The sample glass shells selected as per col (4) of the Table 1, shall be examined for dimensional requirements as per **4.1**

A glass shell failing in one or more of the requirements of **4.1** shall be termed as defective.

The lot shall be accepted as conforming to specifications if the number of defectives is less than or equal to the acceptance number given in col (5) of Table 1.

ANNEX A

(*Clause* 4.1.1)

GAUGE TEST FOR LENGTH AND DIAMETER

A-1 PROCEDURE

A-1.1 Test the length of the glass shell sample with the 'GO' and 'NO GO' length gauges. A typical length gauge is shown in Fig. 2. Find out whether it satisfies the requirements prescribed in **4.1.1**.

A-1.2 Test the diameter of the glass shell sample with 'GO' and 'NO GO' ring gauges. A typical range gauge is shown in Fig. 3. Find out whether it satisfies the requirements prescribed in **4.1.1**.

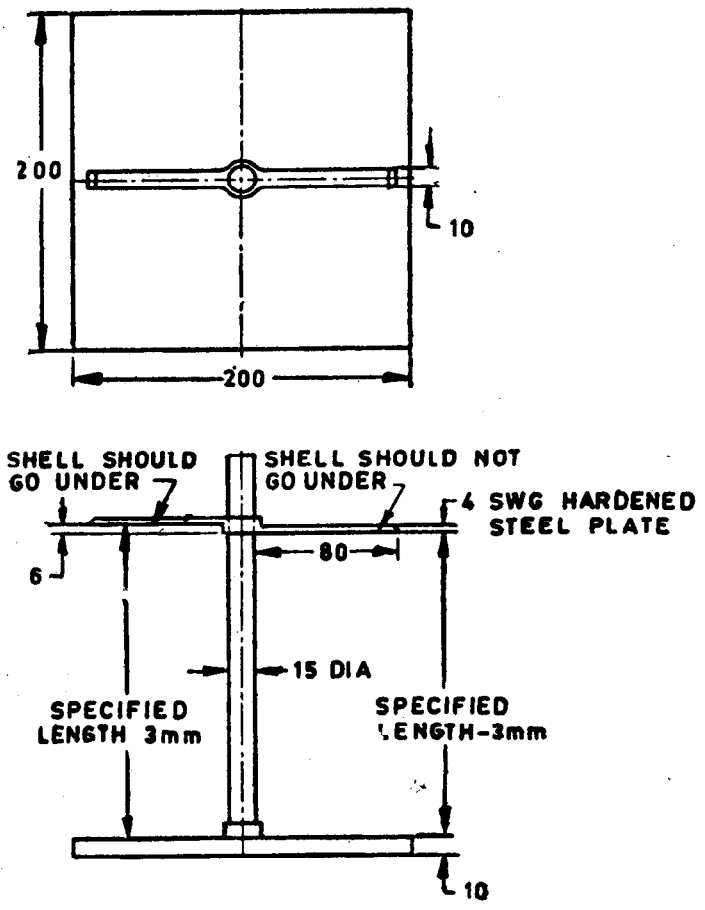


FIG. 2 GAUGE FOR TESTING LENGTH OF THE SHELL

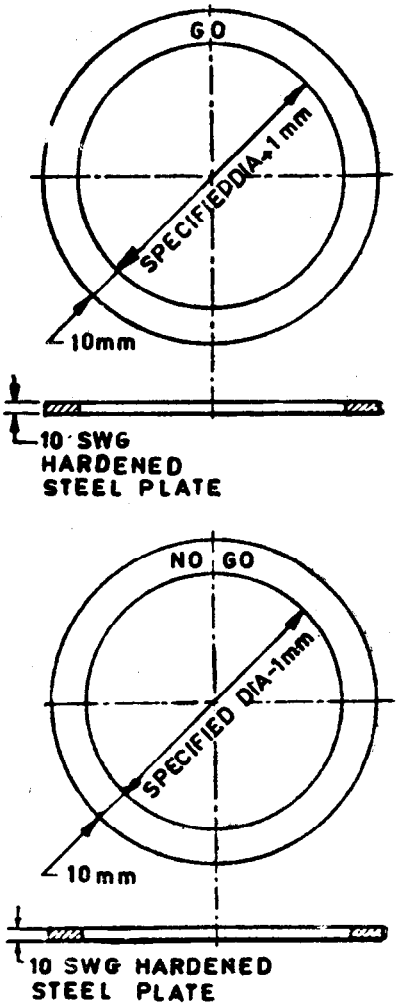


FIG. 3 RING GAUGE FOR TESTING DIAMETER OF THE SHELL

NOTE — This is only a typical representative shape to indicate various terms used.

Standard Mark

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Doc : No. CDC 10 (9672)

Amendments Issued Since Publication

Amend No.	Date of Issue	Text Affected

BUREAU OF INDIAN STANDARDS

Headquarters :

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones : 331 01 31, 331 13 75

Telegrams : Manaksanstha
(Common to all Offices)

Regional Offices :	Telephone
Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg NEW DELHI 110002	{331 01 31 331 13 75
Eastern : 1/14 C. I. T. Scheme VII M, V. I. P. Road, Maniktola CALCUTTA 700054	37 86 62
Northern : SCO 445-446, Sector 35-C, CHANDIGARH 160036	2 18 43
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Printed at Printwell Printers, Delhi, India